

April 2, 2003

Mr. Rick Sprott, Director
Utah Division of Air Quality
Utah Department of Environmental Quality
P.O. Box 144820
Salt Lake City, UT 84114-4820

Attention: Rusty Ruby, NSR Section Head

Dear Director Sprott:

Request for AO Extension: Further Testing and Operation of Over Fire Air

Intermountain Power Service Corporation (IPSC) submitted a notice of intent (NOI) for an experimental approval order to demonstrate and collect data on overfire air (OFA) at the Intermountain Generating Station (IGS) in Delta, Utah. The IGS is a coal-fired steam-electric generating plant located in Millard County. The Utah Division of Air Quality (UDAQ) subsequently issued an experimental approval order (AO #DAQE-AN0327011-03, attached) for overfire air (OFA) on Unit One at IGS. IPSC is seeking, with this letter, an extension to certain terms of the experimental AO.

AO DESCRIPTION

UDAQ permitted IPSC to install a multi-port overfire air system used to control NO_x generation from coal combustion. The AO further allowed operation of the OFA system for trial testing to obtain data for further permitting, not to exceed 150 days from the date of the experimental AO (February 14, 2003). IPSC initially submitted an NOI on September 23, 2002 requesting approval to install and operate an OFA system. Due to the lack of supporting data required for the Utah Division of Air Quality to issue an Intent to Approve, we requested approval to install and test an OFA experimentally. Testing will be performed to demonstrate the effectiveness of overfire in NO_x control, as well as data collection that the DAQ can use to make a final determination in permitting continuous operation of the OFA system. Specific details of the system and expected performance criteria were submitted in the NOI process described above.

REQUESTED EXTENSION TO PERMIT CONDITIONS

IPSC is specifically requesting an extension to condition #3 of the experimental AO. We interpret that condition #3 requires the shut down of the over fire air system once the testing for permit data collection is complete. The OFA has been installed pursuant to the Experimental AO but it cannot be used after the authorized test unless and until the NOI is approved by DAQ. Thus, after Unit 1 restarts and the tests are completed, the OFA will not be used for several weeks or months, with the result that there will be no OFA-driven NO_x reductions during that

IP11_002196

time. IPSC is requesting an extension to allow operation of the OFA system beyond permit testing for the following reasons:

1. Mercury Testing - IPSC is planning to perform additional mercury testing in preparation for EPA's new mercury MACT standard for utilities. IPSC has apparently set the bar for the MACT standard with the test results of the 1999 ICR mercury testing. Since the unit configuration has changed since then (OFA, greater heat input, scrubber wall rings), we wish to retest in concert with other industry parties, including the Electric Power Research Institute (EPRI) and the Utility Air Regulatory Group (UARG). Although the specific time frame has not yet been determined, the test will consist of a 30-day continuous on-line monitoring analysis, with intermittent Ontario-Hydro mercury stack tests interspersed throughout the same period. To optimize the effectiveness of the testing we need to operate as close as possible to normal operating scenarios, including the use of OFA. EPA is also very interested in having this additional data available for the mercury MACT standard database.
2. Operating Shakedown - Although IPSC should be able to obtain sufficient data for permitting during the initial 30 to 45 day operating period, we feel that further continuous OFA operation is necessary to fully "shakedown" OFA for operational and performance evaluations, specifically in preparation to the proposed mercury testing.
3. Environmental Benefit - Continued operation and testing of OFA for purposes beyond the initial permit data collection can result in NOx reductions greater than otherwise would occur. Emissions of CO will be reduced to the maximum extent possible through the use of good operating practices, which will most likely be BACT for CO in the final AO for the OFA. Continued extended OFA operation will not cause a nuisance because there will be no persons or property affected by the increase in CO emissions. The CO emissions resulting from extended operation of OFA will not cause or contribute to any violation of the National Ambient Air Quality Standards for CO. There will be no adverse impact on Class I areas, and the reductions in NOx will lessen precursors of regional haze.

Additionally, the plain language of the emergency AO allows trial test operations for up to 150 days from the date of the emergency AO. We believe our request qualifies as trial test operations. Therefore, IPSC requests that UDAQ allow continuous operation of the OFA under condition #3 of the emergency AO until the earlier of the 150-day period (ending July 14, 2003), or the issuance of a final permanent AO.

If your office feels that our request is permissible under the current experimental AO, please respond by return mail accordingly. If your office considers that our request cannot be allowed, please consider this letter as a request for variance for presentation to the Utah Air Quality Board. IPSC will then submit a formal variance request form for review by the Air Board as required upon your denial of this request.

Mr. Rick Sprott
April 2, 2003
Page 3

If you have any questions, please contact Dennis Killian at 435-864-4414, or by e-mail at dennis-k@ipsc.com.

Cordially,

George W. Cross
President & Chief Operations Officer

BP/RJC:jmg
Enclosure: Experimental Approval Order

cc: Blaine Ipson, IPSC
James Holtkamp, LLG&M
Eric Tharp, LADWP

IP11_002198

January 30, 2003

Rick Sprott, Director
Utah Division of Air Quality
Utah Department of Environmental Quality
P.O. Box 144820
Salt Lake City, UT 84114-4820

Attention: Nando Meli, NSR Engineer

Dear Director Sprott,

NOTICE OF INTENT: Experimental Demonstration Project for Over Fire Air

Intermountain Power Service Corporation (IPSC) is submitting this notice of intent (NOI) for an experimental approval order to demonstrate and collect data on overfire air (OFA) at the Intermountain Generating Station (IGS) in Delta, Utah. The IGS is a coal-fired steam-electric generating plant located in Millard County.

PROJECT DESCRIPTION

IPSC is proposing to install a multi-port overfire air system used to control NO_x generation from coal combustion. The overfire air system will redirect approximately 1015 percent of total combustion air to a staged system of ports located directly above the top row of burners.

PROJECT PURPOSE

IPSC submitted an NOI on September 23, 2002 requesting approval to install and operate an OFA system. Due to the lack of supporting data required for the Utah Division of Air Quality to issue an Intent to Approve, we are requesting approval to install and test an OFA experimentally. Testing will be performed to demonstrate the effectiveness of overfire in NO_x control, as well as data collection that the DAQ can use to make a final determination in permitting continuous operation of the OFA system. Specific details of the system and expected performance criteria were submitted in the NOI process described above.

REQUESTED PERMIT CONDITIONS

IPSC is specifically requesting approval for the following:

- 1) Installation of OFA system in the Unit 1 boiler. (30 day installation period.)
- 2) Approval to operate the OFA for a sufficient time period that allows fine tuning and testing of the OFA system. (90 to 120 day test period.)

TESTING & PERMIT CONDITIONS

IPSC will perform pre-installation and post-installation testing of the OFA system at the following configurations:

IP11_002199

Full load operation with OFA at zero open, one-third open, two-third open, and full-open service.

Adjustments to excess air at each OFA service position.

IPSC testing will consist of monitoring the following parameters specific to OFA performance:

- CO
- NOx
- Excess O2
- LOI

Attachment A describes the operating and control strategies, along with operating parameters by which OFA performance will be evaluated.

IPSC also affirms that the OFA system will not be operated in a manner that deviates from the current Title V Operating permit conditions for IGS.

DEMONSTRATION

IPSC shall provide to DAQ the data compiled from testing so that the DAQ can determine conditions for permit approval to operate OFA continuously. Data will be compiled and submitted within 45 days of testing.

If you have any questions, please contact Dennis Killian at 435-864-4414, or by e-mail at dennis-k@ipsc.com.

Cordially,

George W. Cross
President & Chief Operations Officer

BP/RJC:jg
Enclosure: Attachment A

cc: Blaine Ipson, IPSC
James Holtkamp, LLG&M
Eric Tharp, LADWP

IP11_002200

Intermountain Generating Station

Boiler Over-Fire Air (OFA) Installation Project

Part 1: Description & Control Outline

Description of the Overfire Air (OFA) System and Control Devices.

The over-fire air (OFA) system at the Intermountain Generating Station (IGS) is being provided by Babcock Power, Inc. (BPI). It consists of two rows of OFA ports located on the elevation immediately above the top burner levels on both the front (south) and rear (north) sides of the boiler. Each row consists of eight, identical, OFA ports with one port located over each of the six burner columns (column ports) and one port located on each end of the OFA rows near the side walls of the boiler (wing ports).

Air to the OFA system is provided by the Secondary Air (SA) system. A feeder duct extends from each SA header duct to the corresponding OFA header through which secondary air is admitted to the OFA headers. Each OFA feeder duct includes isolation dampers operated by Jordan rotary electrical drives.

OFA airflow to the boiler is admitted and controlled through the OFA port dampers. Each OFA port is partitioned into separate 1/3 and 2/3 sections. Airflow, through each partition, is controlled by port dampers located in each partition. The four, 1/3 port dampers for an OFA row half are connected or ganged together for simultaneous operation by a Jordan rotary electrical drive. The same configuration is implemented for the 2/3 port damper sets. This creates a total of four, 1/3 port dampers/drives and four, 2/3 port dampers/drives for air flow control to the boiler.

Control and monitoring of all OFA damper drives will be done by the IGS combustion control system. Additionally, an array of three Air Monitor Corporation VOLU-probes and thermocouples will measure OFA mass flow through each of the feeder ducts.

Description of the Proposed Control Strategy.

Note: All boiler load setpoint values and the OFA secondary air ratio setpoint curve, described below, are initial values. These values will be revised based on the results of the commissioning performance tests. Please refer to documentation to be provided by BPI.

OFA is most effective controlling NO_x formation at unit loads above 60% of the rated load of 950 MW. When utilized at the 60% load point and above, OFA flow will be accomplished by the combination of opening OFA feeder and port dampers and decreasing the combustion air damper positions, so as to maintain target total SA flow based on unit load.

The OFA port and feeder duct dampers are not modulating and will be operated either fully open or fully closed (except for biasing of the open position to achieve balanced O₂ distribution across the burner front). SA airflow to the OFA system is attained by simultaneously decreasing the openings of all the combustion air dampers feeding each of the burner elevations that are in operation. This decrease is to be superimposed on the existing automatic control biasing of each elevation combustion air in accordance with pulverizer loading.

This SA damper control is additive to the existing bias required to change burner airflow in proportion to the individual pulverizer load. The action of the sum of both biases will result in less secondary air directly to the burners, as OFA is being introduced, but the relative secondary air distribution between burner elevations will remain unchanged.

BPI will provide a setpoint curve showing the desired ratio of OFA flow to secondary airflow as a function of boiler load. These values will be confirmed or revised based upon actual tests.

The OFA port relative open area sizes, 1/3 and 2/3, are calculated to provide the correct velocity of the OFA to attain the proper penetration of the OFA into the combustion region of the furnace above the burners. All ports of a given kind, 1/3 or 2/3, will open or close following a program designed to open the correct area to roughly produce the proper penetration velocity as the OFA air flow rate changes with boiler load. The initial program is as follows:

| | |
|-------------------------|----------------------------------|
| 0 to 60% boiler load: | All 1/3 and 2/3 ports closed |
| 60 to 75% boiler load: | 1/3 ports open, 2/3 ports closed |
| 75 to 90% boiler load: | 1/3 ports closed, 2/3 ports open |
| 90 to 100% boiler load: | 1/3 ports open, 2/3 ports open |

An individual manual/automatic and bias station per port group damper drive will be provided.

Part 2: Target Operating Parameters for OFA Design

The OFA modifications shall provide for a continuous boiler rating of 6,900,000 lbs/hr output at 1005°F superheat and 1005°F reheat temperature under normal operating conditions. These modifications shall include the design, fabrication and installation on both IGS Units 1 & 2 for an overfire air system capable of providing a reduction in NOx emissions of 15% and consistent NOx emissions of less than 0.40 lbs/MMBTU under all operating modes.

Of particular interest to IPSC are the performance parameters associated with operation at 950 Megawatts gross generation (6.75 MMlbs/hr steam flow). These include:

- a. Total NOx output of 0.40 lbs/MMBTU or less and an overall reduction of 15%. Current maximum average of 0.45 lbs/MMBTU.
- b. Superheat and reheat temperatures as well as NOx emissions must remain within the contract stated acceptable ranges throughout the test.
- c. Impact on average unburned carbon (LOIs) and carbon monoxide (CO) concentrations within the boiler.
- d. The above operational parameters shall be verified in a steady state operational test within 30 days of installation. Steady state operation shall be defined as stable and reliable operation at and within the following operating conditions and ranges for a period of at least 7 days:
 - 7 pulverizers in service (E and G Pulverizers alternately out-of-service).
 - Excess air to be controlled between 2.5 to 3.2%.
 - Superheat and convection surfaces maintained at 80-85% cleanliness
 - Boiler tube maximum allowable metal temperatures must not be exceeded.
 - Turbine throttle pressure of 2375 psi.
 - Furnace cleanliness maintained at 85-90% actual cleanliness.
 - Superheat attemperator spray flow at or above 50,000lbs/hr
 - Reheat attemperator spray flow at 0 lbs/hr

NOTE: These are target parameters only for purposes of OFA design and performance evaluation, and in no way are intended to limit boiler operation in any way.

Part 3: Good Combustion Practice

Since fuel utilization and combustion efficiency suffer in attempts to minimize NO_x generation in the boiler, CO can rise due to incomplete or poor combustion. There are no add-on controls specific to CO technologically, nor are they commercially available in any form for utility steam generators. As a matter of practice, BACT for CO is considered to be Good Combustion Practice.

Good combustion practice (GCP) is defined as system design, operation, and maintenance techniques which can increase combustion efficiency. The GCP control strategy includes collectively applying a number of combustion conditions to achieve three broad goals:

- (1) Maximize fuel utilization and boiler efficiency;
- (2) Minimize byproducts of poor combustion (CO) and
- (3) Minimize creation of combustion related pollutants (NO_x).

The emphasis in an effective good combustion practice lies in the design of the combustion system. There are several specific measurable parameters that compose a set of combustion indicators that can be related directly or indirectly to the design of the GCP components. These combustion parameters are:

- CO levels in the flue gas;
- Loss of Ignition in ash;
- NO_x levels in the flue gas
- Excess O₂ in the combustion air; and
- Heat Rate (i.e., plant efficiency - heat input vs. load production).

Good combustion is essentially a balance of the GCP components, which by the nature of the combustion process, are antagonistic. High fuel utilization and boiler performance increases NO_x creation. Minimizing NO_x through combustion controls increases CO and LOI, and decreases efficiency. GCP design balances these effects to optimize each component. CO is a good indicator of combustion efficiency, which when measured before and after modifications to a combustion process, can verify GCP design.

The ability to maintain low CO and NO_x concentrations in flue gases is dependent on combustion design features such as those found in retrofit OFA ports. Once the design has been demonstrated to be GCP, GCP is further employed in operating and maintenance practices. Since CO is minimized as an inherent component to maximizing efficiency and lowering operating costs, there exists a natural incentive towards GCP in

OFA operation and maintenance. GCP therefore can be demonstrated through review of data presently being collected.

Part 4: Permitting

IPSC proposes that to verify GCP in the OFA design, the GCP components discussed above be measured during both a pre-OFA installation test and a post OFA installation test. CO results will be reported to the Utah DAQ accordingly to confirm GCP. The other parameters will be checked for quality assurance and performance of the tests. Once GCP has been confirmed in the design of the OFA with the pre- and post-OFA installation tests, IPSC proposes to maintain for inspection certain records of operating and maintenance data to reflect continuing GCP utilizing data sources presently and readily available.

IPSC has requested that the DAQ provide Approval to construct the OFA modifications as described above and in our Notice of Intent. Upon demonstrating GCP and verifying NOx reduction and CO values after installation, IPSC requests that DAQ proceed with issuing an Intent to Approve to complete this project.

November 3, 2003

Rick Sprott, Director
Utah Division of Air Quality
Utah Department of Environmental Quality
P.O. Box 144820
Salt Lake City, UT 84114-4820

Attention: Nando Meli, NSR Engineer

Dear Director Sprott,

NOTICE OF INTENT: Experimental Demonstration Project for Over Fire Air

Intermountain Power Service Corporation (IPSC) is submitting this notice of intent (NOI) for an experimental approval order to continue a demonstration project on overfire air (OFA) at the Intermountain Generating Station (IGS) in Delta, Utah. The IGS is a coal-fired steam-electric generating plant located in Millard County.

PROJECT DESCRIPTION

IPSC installed a multi-port overfire air (OFA) system used to control NO_x generation from coal combustion. IPSC was granted approval for installation and testing of the OFA system pursuant to an experimental approval order, #DAQE-AN0327012A-03.

PROJECT PURPOSE

IPSC installed OFA to demonstrate the effectiveness of overfire in NO_x control, as well as data collection. Data collected is being utilized in permitting continuous operation of the OFA system, as well as setting parameters for good combustion practice. Further, the OFA system is being tested in a variety of operating scenarios and fuel mixes. A report has been filed with sufficient data for permitting under a permanent approval order.

IPSC feels that continued operation of the OFA system is necessary to determine what long term anomalies may occur from day-to-day OFA operation. Fluctuations in fuel quality is particularly of interest to IPSC. We believe the relationship established between boiler O₂ levels and CO emissions will not change, and we do not intend to perform any further testing in that regard.

REQUESTED PERMIT CONDITIONS

Since the testing period allowed by DAQE-AN0327012A-03 is soon to expire, IPSC is requesting approval to continue to operate the OFA for a sufficient time period that allows further fine tuning of the OFA system (180 day continued test period.)

IPSC will operate the OFA in the same manner dictated by the operating conditions of DAQE-AN0327012A-03. We do not believe emissions will change from the scope originally specified in the NOI for DAQE-AN0327012A-03, so testing conditions would not be necessary.

IP11_002206

IPSC also affirms that the OFA system will not be operated in a manner that deviates from the current Title V Operating permit conditions for IGS.

ENVIRONMENTAL IMPACT

UDAQ should also consider the potential reductions in overall NOx emissions during a continued-use period of OFA operation. IPSC can not project what actual NOx reductions may entail since the OFA system will be operated to keep CO emissions within permit levels, but we believe it can be significant for certain coal supplies when compared to combustion without OFA.

Further, the continued use of OFA can result in higher ash sales, thus causing less ash to be landfilled. Accordingly, these impacts can be assumed to result in an environmental benefit when OFA is utilized.

If you have any questions, please contact Dennis Killian at 435-864-4414, or by e-mail at dennis-k@ipsc.com.

Cordially,

George W. Cross
President & Chief Operations Officer

BP/RJC:jg

cc: Blaine Ipson, IPSC
James Holtkamp, LLG&M
Eric Tharp, LADWP

IP11_002207

April 2, 2003

Rick Sprott, Director
Utah Division of Air Quality
Utah Department of Environmental Quality
P.O. Box 144820
Salt Lake City, UT 84114-4820

Attention: Rusty Ruby, NSR Section Head

Dear Director Sprott,

Request for AO Extension: Further Testing and Operation of Over Fire Air

Intermountain Power Service Corporation (IPSC) submitted a notice of intent (NOI) for an experimental approval order to demonstrate and collect data on overfire air (OFA) at the Intermountain Generating Station (IGS) in Delta, Utah. The IGS is a coal-fired steam-electric generating plant located in Millard County. The Utah Division of Air Quality (UDAQ) subsequently issued an experimental approval order (AO #DAQE-AN0327011-03, attached) for over fire air (OFA) on Unit One at IGS. IPSC is seeking with this letter an extension to certain terms of the experimental AO.

AO DESCRIPTION

UDAQ permitted IPSC to install a multi-port overfire air system used to control NOx generation from coal combustion. The AO further allowed operation of the OFA system for trial testing to obtain data for further permitting, not to exceed 150 days from the date of the experimental AO (February 14, 2003). IPSC initially submitted an NOI on September 23, 2002 requesting approval to install and operate an OFA system. Due to the lack of supporting data required for the Utah Division of Air Quality to issue an Intent to Approve, we requested approval to install and test an OFA experimentally. Testing will be performed to demonstrate the effectiveness of overfire in NOx control, as well as data collection that the DAQ can use to make a final determination in permitting continuous operation of the OFA system. Specific details of the system and expected performance criteria were submitted in the NOI process described above.

REQUESTED EXTENSION TO PERMIT CONDITIONS

IPSC is specifically requesting an extension to condition #3 of the experimental AO. We interpret that condition #3 requires the shut down of the over fire air system once the testing for permit data collection is complete. The OFA has been installed pursuant to the Experimental AO but it cannot be used after the authorized test unless and until the NOI is approved by DAQ. Thus, after Unit 1 restarts and the tests are completed, the OFA will not be used for several weeks or months, with the result that there will be no OFA-driven NOx reductions during that time. IPSC is requesting an extension to allow operation of the OFA system beyond permit testing for the following reasons:

IP11_002208

- 1) Mercury Testing - IPSC is planning to perform additional mercury testing in preparation for EPA's new mercury MACT standard for utilities. IPSC has apparently set the bar for the MACT standard with the test results of the 1999 ICR mercury testing. Since the unit configuration has changed since then (OFA, greater heat input, scrubber wall rings), we wish to retest in concert with other industry parties, including the Electric Power Research Institute (EPRI) and the Utility Air Regulatory Group (UARG). Although the specific time frame has not yet been determined, the test will consist of a 30 day continuous on-line monitoring analysis, with intermittent Ontario-Hydro mercury stack tests interspersed through-out the same period. To optimize the effectiveness of the testing we need to operate as close as possible to normal operating scenarios, including the use of OFA. EPA is also very interested in having this additional data available for the mercury MACT standard database.
- 2) Operating Shakedown - Although IPSC should be able to obtain sufficient data for permitting during the initial 30 to 45 day operating period, we feel that further continuous OFA operation is necessary to fully "shakedown" OFA for operational and performance evaluations, specifically in preparation to the proposed mercury testing.
- 3) Economics - IPSC intends to use OFA to control NOx in lieu of combustion modification practices (burners-out-of-service, excess air, etc) which, although effective, is costly and cumbersome. We expect that continuous OFA operation can save up to \$810,000 per month in operating costs tied mostly to fuel.
- 4) Environmental Benefit - Continued operation and testing of OFA for purposes beyond the initial permit data collection can result in NOx reductions greater than otherwise would occur. Emissions of CO will be reduced to the maximum extent possible through the use of good operating practices, which will most likely be BACT for CO in the final AO for the OFA. Continued extended OFA operation will not cause a nuisance because there will be no persons or property affected by the increase in CO emissions. The CO emissions resulting from extended operation of OFA will not cause or contribute to any violation of the National Ambient Air Quality Standards for CO. There will be no adverse impact on Class I areas, and the reductions in NOx will lessen precursors of regional haze.

Additionally, the plain language of the emergency AO allows trial test operations for up to 150 days from the date of the emergency AO. We believe our request qualifies as trial test operations. Therefore, IPSC requests that UDAQ allow continuous operation of the OFA under condition #3 of the emergency AO until the earlier of the 150 day period (ending July 14, 2003), or the issuance of a final permanent AO.

If your office feels that our request is permissible under the current experimental AO, please respond by return mail accordingly. If your office considers that our request cannot be allowed, please consider this letter as a request for variance for presentation to the Utah Air Quality Board. IPSC will then submit a formal variance request form for review by the Air Board as required upon your denial of this request.

If you have any questions, please contact Dennis Killian at 435-864-4414, or by e-mail at dennis-k@ipsc.com.

Cordially,

George W. Cross
President & Chief Operations Officer

BP/RJC:jg
Enclosure: Experimental Approval Order

cc: Blaine Ipson, IPSC
James Holtkamp, LLG&M
Eric Tharp, LADWP

IP11_002210